REMARKS

This Preliminary Amendment is being filed in conjunction with a Request for Continued Examination (RCE) application, which is being submitted in response to the Final Office Action dated February 13, 2002 and the Advisory Action dated April 19, 2002.

I.   Summary of the Examiner's Rejections

Claims 1-31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Butler, et al. (U.S. Patent No. 6,018,340) in view of Ishikura, et al. (U.S. Patent No. 5,585,821) in further view of Dye (U.S. Patent No. 6,108,014).

II.   Summary of the Applicant's Amendments

The specification has been amended to correct minor typographical and grammatical errors presented therein, and to make the description conform with the originally filed drawings. The Applicants submit that no new matter has been added by these revisions.

Claims 1, 7, 10, 19 and 23 have been amended. Claims 32-43 have been added.

III.   Applicant's Response to the Examiner's Rejections

The Applicants traverse the rejection of the aforementioned claims as provided in greater detail below.

A.   Rejection of claims 1-6

The present invention is directed to a system and corresponding method(s) for supporting multiple displays per drawing surface, wherein virtual desktop mode (i.e. incompatible resolution capability) operation is precluded. By preventing virtual desktop mode operation from occurring, the resulting plurality of displays are capable of providing a processed image or series of images without image distortion. In computer graphics applications, it is not uncommon for a single drawing surface (i.e. frame buffer) to support multiple displays, with each display having different resolution capabilities. In those situations where multiple displays having different resolutions are being used, an image or object that is being presented on a first of the displays may not be able to be presented on a plurality of the remaining displays. In such a situation, the resources of the computer system, corresponding to the displays which cannot present a given

object or image, are being wasted. The claimed invention is directed to a system and corresponding methods which prevent virtual desktop mode operation by providing that each of the corresponding displays of a system are capable of presenting representative video image or object data by being provided with the same display capability parameters. The provision of each of the displays having substantially similar display capability characteristics is performed during a system start-up operation or a monitor change process, such as when switching from an LCD display only to a LCD and CRT display mode. The corresponding advantages and features of the present invention are made possible by performing the following operating steps as defined in claim 1:

> "...receiving capability parameters regarding a first display of the multiple displays, wherein the capability parameters comprise display resolution and display pixel depth;
>   substituting selected display capabilities for the received capability parameters; and
>   providing the selected display capabilities to an operating system..."

Such combination of steps is not taught or suggested individually, or in combination, by the references cited by the Examiner. Accordingly, the combination of Butler, et al., Ishikura, et al., and Dye does not render the claimed invention obvious.

As understood, Butler, et al. is directed to a particular method for allocating graphical information such as the position of a mouse cursor in an application window between multiple monitors so as to define a virtual monitor space. A description of how to determine which of the multiple monitors the cursor will be displayed on is presented at col. 9, line 23-col. 10, line 65, by determining the monitor that is closest to the location to which the user has moved the cursor. The cursor is then displayed in a position just inside the edge of the determined monitor (col. 10, lines 56-57). Butler, et al. also discloses the use of a graphic user interface (GUI) and graphical device interface (GDI) that serves as an interface in the application programs and a device driver (*see,* for example, FIG. 5 and col. 5, lines 11-18). As disclosed, as part of initialization, the GDI obtains a list of functions that the device driver supports such as drawing solid lines, and supporting particular fonts (col. 5, lines 34-54). As provided, these functions are those that are supported by the device driver, not capability parameters such as display resolution and display pixel depth of one or more of the plurality of monitors as defined in claim 1.

Moreover, Butler, et al. appears to be silent on substituting selected display capabilities of multiple monitors, in that a provision for receiving or substituting display capability parameters

is not disclosed therein. Accordingly, Butler, et al. does not render the invention as defined in claim 1 obvious.

Adding the teachings of Ishikura, et al. to the teachings of Butler, et al. also does not render the claimed invention obvious as Ishikura, et al. does not overcome the aforementioned deficiencies of Butler, et al. In addition, Ishikura, et al. does not teach or suggest the features of the instant invention as defined in claim 1. As understood, Ishikura, et al. is directed to an apparatus and method for moving a mouse pointer among several monitors or among a plurality of windows displayed on a single monitor. Each of the monitors or screens is disclosed as having one or more icon display areas that correspond to the other monitors or screens (see, for example, col. 3, lines 8-13). When the mouse pointer is moved to one of these icons, it jumps to the monitor or screen to which the icon corresponds (see, for example, col. 30, line 17-29). As properly read, Ishikura, et al. does not teach or suggest "...receiving capability parameters regarding a first display of multiple displays..." and "...substituting selected display capabilities for the received capability parameters..." as defined in claim 1. In fact, the Examiner admits that Ishikura, et al. does not teach or suggest receiving capability parameters that comprise display resolution or display pixel depth (see, Office Action dated February 13, 2002, page 1, paragraph 2). Therefore, Ishikura, et al. does not render the claimed invention obvious. As Ishikura, et al. does not render the claimed invention obvious, and Butler, et al. does not render the claimed invention obvious, the combination of these two references cannot render the invention as defined in claim 1 obvious.

To overcome the aforementioned shortcomings, the Examiner has also submitted combining the Dye reference to the combination of Butler, et al. and Ishikura, et al. to render the claimed invention obvious. For the reasons set forth below, the combination of Butler, et al., Ishikura, et al. and Dye does not render the invention as defined in claim 1 obvious.

As understood, Dye is directed to a system and corresponding method(s) for storing video data in various bit per pixel formats and presenting such video data having different bit per pixel formats on a single video monitor. (See, for example, col. 3, lines 2-5 and FIG. 16; col. 24, lines 27-64). As illustrated in FIG. 16 and disclosed, for example, at col. 24, lines 27-64, the disclosed system includes a single video monitor, including a plurality of windows (w0-w3) which displays video output comprising a plurality of video objects, each having differing bit per pixel

formats. Thus, Dye is directed to a virtual desktop mode operation which is in direct contrast to the invention as defined in claim 1.

In addition, Dye does not disclose "...substituting selected display capabilities for the received capability parameters..." of the several displays as Dye is not directed to nor discloses a multiple display system. Moreover, the single display system of Dye operates in virtual desktop mode as differing bit per pixel objects are presented on the same display. The Examiner has pointed to col. 6, lines 25-29 as providing a teaching of pixel depth; and asserts that such term being used within the larger specification provides a teaching or suggestion of the Applicants' invention. However, the Applicants direct the Examiner's attention to, for example, col. 6, lines 16-24 and specifically to lines 22-24, and col. 11, lines 52-58; col. 12, lines 36-46; col. 17, lines 59-62; col. 18, lines 33-54; and FIG. 16 and col. 24, lines 27-64, where Dye discloses that the pixel depth and per pixel values relevant to the disclosed invention are those "...used for each application..." or "...objects..." (*see*, col. 6, lines 31-32). Thus, the pixel depth and other graphical data, disclosed in Dye is that of the object being displayed or application that is being processed; not the capabilities of the several displays being supported by the present invention. Consequently, Dye is directed to a different and unrelated problem than that claimed in the present invention.

Accordingly, as Dye is directed to a different problem or issue as compared to the presently claimed invention and does not operate in a manner similar to the present invention, Dye cannot and does not render the invention as defined in claim 1 obvious. Consequently, adding the teachings of Dye to the teachings of Butler, et al. and Ishikura, et al. will also not render the invention as defined in claim 1 obvious for the reasons set forth above. Accordingly, reconsideration of the rejection of claim 1 is respectfully requested.

Claims 2-6 directly or indirectly depend and include all the limitations of claim 1 and are allowable at least for the reasons associated with claim 1. Accordingly, reconsideration of the rejection of claims 1-6 is respectfully requested.

B.   Rejection of claims 7-12

Claim 7 is an apparatus claim directed to a multiple display supporting module that is capable of supporting multiple displays in a non-virtual desktop mode of operation. Claim 7, like claim 1 above includes limitations directed to:

> "...receiving capability parameters regarding a first display of the multiple displays, wherein the capability parameters comprise display resolution and display pixel depth;
>
> ...substitute selected display capabilities for the received capability parameters..."

As such, claim 7 is allowable at least for the reasons set forth above with respect to claim 1. Accordingly, reconsideration of the rejection of claim 7 is respectfully requested.

Claims 8-12 directly or indirectly depend upon and include all the limitations of claim 7 and are allowable at least for the reasons associated with claim 7. Accordingly, reconsideration of the rejection of claims 7-12 is respectfully requested.

C.   Rejection of claims 13-18

Claim 13 is an apparatus claim directed to a storage medium which is used in conjunction with a processing module such that when the operation instructions stored in the storage medium are executed by the processing module, the processing module provides for multiple displays on a multiple display system not operating in a virtual desktop mode. Claim 13, like claim 1 above, includes limitations directed to:

> "...second storage means for storing operational instructions that cause the processing module to substitute selected display capabilities for the capability parameters..."

As such, claim 13 is allowable at least for the reasons set forth above with respect to claim 1. Accordingly, reconsideration of the rejection of claim 13 is respectfully requested.

Claims 14-18 directly or indirectly depend upon and include all the limitations of claim 13 and are allowable at least for the reasons associated with claim 13. Accordingly, reconsideration of the rejection of claims 13-18 is respectfully requested.

D.   Rejection of claims 19-22

Claim 19 is a method claim defining the operating steps used by a system for supporting multiple displays per drawing surface. Amended claim 13 includes the following limitations:

"...receiving capability parameters for each display of the multiple displays...

    determining selected display capabilities based on the capability parameters of each display of the multiple display;

    substituting the display capabilities for the capability parameters of at least one display of the multiple displays..."

Such a combination of steps is not disclosed in the combination of references as cited by the Examiner. Consequently, the combination of references cannot and does not render the invention as defined in claim 19 obvious.

As recited, claim 19 defines a method of operation where a selected display parameter is substituted as the display capability parameters for the multiple displays of a multiple display system, such that the larger system will not operate in a video desktop mode. The advantages of not operating in the video desktop mode is described in greater detail above in Section III(A). Moreover, as discussed in greater detail above, none of the cited references individually, or in combination, teaches or suggests "...substituting the selected display capability parameters of at least one display of the multiple displays..." Specifically, Butler, et al. is silent on substituting selected display capabilities of multiple monitors. Ishikura, et al. does not disclose receiving capability parameters regarding different displays. And Dye does not disclose either "...receiving capability parameters for each display of multiple displays..." or "...substituting selected display capabilities for the capability parameters of at least one display of the multiple displays..." as Dye is not directed to a multi-display system. Nor does Dye substitute display parameters of one display for another display, as disclosed in greater detail above, the system disclosed in Dye operates in a substantially virtual desktop mode as each of the window of a single display operates on a different "bit per pixel basis" (*see*, for example, col. 24, lines 27-64).

Consequently, as neither Butler, et al., Ishikura, et al. or Dye teach or suggest at least one principal limitation defined in claim 19, the combination of the aforementioned references cannot and does not render the invention as defined in claim 19 obvious. Accordingly, reconsideration of the rejection of claim 19 is respectfully requested.

Claims 20-22 directly or indirectly depend upon and include all the limitations of claim 19 and are allowable at least for the reasons associated with claim 19. Accordingly, reconsideration of the rejection of claims 19-22 is respectfully requested.

E.   Rejection of claims 23-26 and 31

Claim 23 is an apparatus claim directed to a multiple display supporting module which includes the following limitations:

"...receiving capability parameters for each display of the multiple displays,

determining selected display capabilities based on the capability parameters of each display of the multiple displays...

substituting the selected display capabilities for the capability parameters of the at least one display of the multiple displays..."

Such combination of features is not disclosed by the combination of references as cited by the Examiner. Claim 23, like claim 19 above, includes the limitations directed to substituting a selected display capability parameters of the multiple displays of a multi-display system. As such, claim 23 is allowable at least for the reasons set forth above with respect to claim 19. Accordingly, reconsideration of the rejection of claim 23 is respectfully requested.

Claims 24-26 and 31 directly or indirectly depend upon and include all the limitations of claim 23 and are allowable at least for the reasons associated with claim 23. Accordingly, reconsideration of the rejection of claims 23-26 and 31 is respectfully requested.

IV.   New Claims

Claims 32-43 have been added to further define the inventive aspects and features of the present invention. It is respectfully submitted that each of these claims includes novel subject matter which is not taught or suggested by the combination of Butler, et al., Ishikura, et al. and Dye.

For example, as disclosed, claim 32 recites a method for supporting multiple displays wherein the display capability parameters of at least one of the multiple displays is received from a corresponding video processor (i.e. graphics card) and substituted as a display capability parameter for the remaining displays. The claimed method can be performed by an associated graphics or suitable computer system during start-up or upon replacing, or otherwise swapping, one display for another display. In this manner, virtual desktop mode operation, where a subset of associated displays will not be able to provide full image data due to differences or inconsistencies between display resolutions is prevented. Such advantages and features are a result of performing the inventive method of the present invention which comprises the steps of "...receiving capability parameters regarding at least a first display of the multiple displays

through a corresponding video graphics card and substituting a selected one of the display capability parameters for the received capability parameters..." The combination of receiving display capability parameters and substituting a selected one of a display capability parameters for the received capability parameters is not taught or suggested by Butler, et al., Ishikura, et al. and Dye individually or in combination. Consequently, the combination of Butler, et al., Ishikura, et al. and Dye cannot and does not render the invention as defined in claim 32 obvious.

Claims 33- 37 directly depend upon and include all the limitations of claim 33 and are allowable at least for the reasons set forth above with respect to claim 32. Accordingly, the invention as defined in claims 32-37 is not taught or suggested by the combination of references as cited by the Examiner.

Moreover, claim 38 is directed to a multiple display supporting module which, like claim 32 above, includes the limitation directed to "...substituting a selected one of a display capability parameters for the received display capability parameters..." As such, claim 38 discloses a system where a particular display capability parameters is substituted as the display capability parameters for the remaining displays in a multi-display system. Such functionality, and the benefits provided thereby is not taught or suggested by any of the aforementioned Butler, et al., Ishikura, et al. and Dye references individually or in combination. Thus, the invention as defined in claim 38 is not rendered obvious by the combination of Butler, et al., Ishikura, et al. and Dye.

Claims 39-40 directly or indirectly depend upon and include all the limitations of claim 38 and are allowable at least for the reasons set forth above with respect to claim 38. Accordingly, the Applicants submit that the invention as defined in claims 38-43 are not rendered obvious.

Based on the above amendments and remarks, the Applicants submit that claims 1-43 are now in proper condition for allowance and such action is earnestly solicited.

The Commissioner is hereby authorized to charge any underpayment or credit any overpayment to Deposit Account No. 50-0441 for any payment in connection with this communication, including any fees for extension of time, which may be required. The Examiner is invited to call the undersigned if such action might expedite the prosecution of this application.

Respectfully submitted,

By: _____
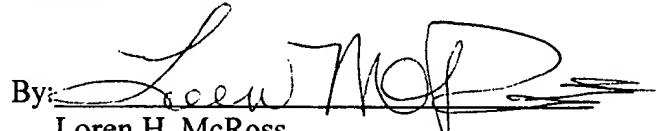
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IN THE SPECIFICATION

Please replace the paragraph beginning on page 2, line 1 with the following:

When the video graphics processing circuit is supplying pixel data to multiple displays, one or more of the displays may be operating in a virtual desktop mode. A display will operate in a virtual desktop mode when its resolution [is less than] does not match the resolution of one or more of the other multiple displays. Typically, the display operating in a virtual desktop mode has a lower resolution than the primary display, thus it is too small to display the full image of the data stored in the frame buffer. When in the virtual desktop mode, only a portion of the image in the frame buffer is presented on screen. To view other portions of the image, a mouse, or other GUI action is performed.

Please replace the paragraph beginning on page 2, line 20 with the following:

As is known, a computing system may include a plurality of video graphics cards, each having a separate display register associated with the operating system. If each card is supporting a single display, all of the displays [operation] operate in full screen mode, i.e., not functioning in a virtual desktop mode. Each card, however, may support multiple displays, recreating the above mentioned virtual desktop operations.

Please replace the paragraph beginning on page 4, line 13 with the following:

The system memory 14 stores an operating system algorithm 32. As is known, the operating system 32 functions to start up the computing system 10 and to maintain operation. As part of the start-up procedure, the operating system 32 provides inquiries to the video graphics cards 16 and 18 to obtain the display capability parameters of a primary display associated therewith. In accordance with the present invention, the video graphics cards 16 and 18 will provide, during some portion of execution of the operating system start-up, the selected display capabilities. Te providing of the selected display capabilities will be discussed in greater detail with reference to Figure 2 and 3.

Please replace the paragraph beginning on page 5, line 1 with the following:

In operation, the drawing engine 34 receives graphical data from the central processing unit 12 and/or video inputs from a video decoder and processes them into RGB data. The graphics driver 36 receives the RGB data and coordinates the storage within the drawing surface 38. In addition, the graphics driver 36 coordinates the retrieval of the RGB data from the drawing surface 38 and provides it to controllers 40 and/or 42. Note that the central processing unit 12 may provide the same or different graphics data to the video graphics cards 16 and 18. As one of average skill in the art would readily appreciate, the computing system 10 may include a single video graphics card that supports multiple displays and/or multiple video graphics cards that each support a single or multiple displays.

IN THE CLAIMS

1. (Twice Amended) A method for supporting multiple displays per drawing surface, the method comprises the steps of:

a) receiving capability parameters regarding a first display of the multiple displays, wherein the capability parameters comprise display resolution and display pixel depth;

b) substituting selected display capabilities for the <u>received</u> capability parameters; and

c) providing the selected display capabilities to an operating system.

7. (Twice Amended) A multiple display supporting module comprises:

a processing module; and

memory operably coupled to the processing module, wherein the memory includes operational instructions that cause the processing module to: (a) receive capability parameters regarding a first display of the multiple displays, wherein the capability parameters comprise display resolution and display pixel depth; (b) substitute selected display capabilities for the <u>received</u> capability [of] parameters; and (c) provide the selected display capabilities to an operating system.

10. (Amended) The multiple display supporting module of claim [10] <u>7</u>, wherein the memory further comprises operational instructions that cause the processing module to receive the capability parameters in accordance with a system start-up.

19. (Twice Amended) A method for supporting multiple displays per drawing surface, the method comprises the steps of:

a) receiving capability parameters for each display of the multiple displays, wherein the capability parameters comprise display resolution and display pixel depth;

b) determining selected display capabilities based on the capability parameters of each display of the multiple displays;

c) substituting the selected display capabilities for the capability parameters of [a respective] <u>at least one</u> display of the multiple displays; and

d) providing the selected display capabilities to an operating system.

23. (Twice Amended) A multiple display supporting module comprises:

a processing module; and

memory operably coupled to the processing module, wherein the memory includes operational instructions that cause the processing module to execute the steps of:

(a) receiving capability parameters for each display of the multiple displays, wherein the capability parameters comprise display resolution and display pixel depth;

(b) determining selected display capabilities based on the capability parameters of each display of the multiple displays;

(c) substituting the selected display capabilities for the capability parameters of [a respective] at least one display of the multiple displays; and

(d) providing the selected display capabilities to an operating system.